

CLAIMS

What is claimed is:

1. An aluminum based alloy, said alloy comprising:
5 1.0 - 2.0% by weight manganese;
a maximum of 0.6% by weight iron;
less than 0.003% by weight beryllium;
the remainder being aluminum and
said alloy characterized by reduced die soldering when used in die
casting operations.
- 10 2. The aluminum alloy of claim 1 further comprising 2.5 - 4.0%
by weight magnesium and 0.001-0.003% by weight beryllium and said alloy
characterized by an elongation value of at least 17%.
- 15 3. The aluminum alloy of claim 2 further comprising a maximum
of 0.45% by weight silicon.
4. The aluminum alloy of claim 3 further comprising a maximum
of 0.10% by weight copper.
5. The aluminum alloy of claim 1 further comprising a maximum
of 0.45% by weight silicon and said alloy characterized by an elongation value of at
least 17%.
- 20 6. The aluminum alloy of claim 5 further comprising 2.5 - 4.0%
by weight magnesium.
7. The aluminum alloy of claim 1 further comprising less than
1.75% by weight magnesium.
- 25 8. The aluminum alloy of claim 7 further comprising a maximum
of 0.10% by weight zinc.
9. The aluminum alloy of claim 7 further comprising a maximum
of 0.2% by weight titanium.
10. The aluminum alloy of claim 8 further 4.2 - 5.0% by weight
copper.
11. The aluminum alloy of claim 8 further a maximum of 0.2% by
weight copper.

-12-

12. An aluminum based alloy for use in forming a die cast product, said alloy having an elongation value of at least 17%, said alloy comprising
5 2.5 - 4.0% by weight magnesium;
 1.0 - 2.0% by weight manganese;
 0.25 - 0.6% by weight iron;
 0.2 - 0.45% by weight silicon;
 less than 0.003% by weight beryllium;
 the remainder being aluminum.

10 13. The aluminum alloy of claim 12 further comprising 0.05 - 0.10% by weight copper.

14. The aluminum alloy of claim 13 further comprising a maximum of 0.10% by weight zinc.

15 15. A modified die-castable aluminum alloy which in its unmodified form includes iron in a certain percentage by weight to at least reduce mold soldering and manganese in a lower percentage by weight than the iron comprising:
 a maximum of 0.6% by weight iron; and
 manganese in a percent by weight higher than the percentage by weight
20 of iron.

16. The aluminum alloy of claim 15 wherein the manganese is present at 1.0 - 2.0% percent by weight.

17. The aluminum alloy of claim 15 wherein the manganese is present in a percent by weight higher than the certain percent by weight of iron in the
25 unmodified form of the alloy.

18. The aluminum alloy of claim 15 wherein the manganese is present at about 1.0% percent by weight.

19. A structural article of manufacture comprising an aluminum alloy having a yield strength of greater than or equal to 11.95 kgf/mm² and an
30 elongation value of greater than or equal to 18%, said aluminum alloy comprising
 2.5 - 4.0% by weight magnesium;
 1.0 - 2.0% by weight manganese;

AMENDED SHEET

-13-

a maximum of 0.6% by weight iron;
 a maximum of 0.45% by weight silicon;
 a maximum of 0.10% by weight copper;
 less than 0.003% by weight beryllium;
 the remainder being aluminum.

5

Svb
B3

20. The article of claim 16 wherein the aluminum alloy includes about 1.1% manganese by weight.

21. A die-castable aluminum alloy comprising:

0.25-0.70% by weight magnesium

1.0 - 2.0% by weight manganese;

a maximum of 0.2% by weight iron;

6.5-7.5% by weight silicon;

a maximum of 0.2% by weight each of additional elements selected from the group of zinc, copper, titanium and beryllium;
 15 the remainder being aluminum; and
 said alloy characterized by reduced die soldering when used in die casting operations.

10
15

22. The alloy of claim 21 in which a maximum of 0.1% by weight zinc is present as an additional element.

20

23. The alloy of claim 22 in which a maximum of 0.2% by weight copper is present as an additional element.

24. The alloy of claim 23 in which a maximum of 0.2% by weight titanium is present as an additional element.

25 0.45% by weight.

26. The alloy of claim 24 in which 0.04-0.07 by weight beryllium is present as an additional element.

30

27. The alloy of claim 25 in which magnesium is present at 0.4-0.7% by weight.

28. A die-castable aluminum alloy comprising:

0.15-0.35% by weight magnesium

1.0 - 2.0% by weight manganese;

Svb
B3

PCT/US 99/21639
IPEN/US 13 APR 2000

-14-

a maximum of 0.1% by weight iron;
 4.2-5.0% by weight copper;
 a maximum of 0.2% by weight each of additional elements selected
 from the group of zinc, silicon, nickel, tin, and titanium;
 5 the remainder being aluminum; and
 said alloy characterized by reduced die soldering when used in die
 casting operations.

29. The alloy of claim 28 in which a maximum of 0.1% by weight
 zinc is present as an additional element.

10 30. The alloy of claim 29 in which a maximum of 0.05% by weight
 silicon is present as an additional element.

31. The alloy of claim 30 in which a maximum of 0.2% by weight
 titanium is present as an additional element.

15 32. A method of producing components by die casting an
 aluminum alloy with reduced die soldering, the method comprising the steps of:
 providing an aluminum alloy having magnesium, zinc, silicon, copper,
 beryllium, titanium, nickel, and tin present in percentages by weight consistent with a
 known aluminum alloy;
 maintaining the iron content of the provided alloy at or below the iron
 20 content of the known aluminum alloy;
 adjusting the manganese content of the alloy to between 1.0-2.0% by
 weight;
 heating the alloy to a temperature conducive to die casting;
 casting a component from the alloy; and
 25 removing the cast component from the die.